

New block Runge-Kutta method with various weights for solving stiff ordinary differential equations

ABSTRACT

This paper discusses the development of a new block Runge-Kutta (NBRK) method with various weights for solving stiff ordinary differential equations (ODEs). Performance of the proposed method in terms of maximum error and computational time is compared with third order RK (RK3) method and modified weighted RK3 method based on Centroidal Mean (MWRK3CeM). Comparison between weights used is also analyzed. Numerical results show that the proposed method outperformed the MWRK3CeM and the RK3 method.

Keyword: Runge-Kutta method; Weights; Stiff ODEs; Centroidal mean